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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/570,553	03/03/2006	Benjamin Chu	R-7695 (1339-5 PCT US)	9958
31554 7590 10/08/2008 CARTER, DELUCA, FARRELL & SCHMIDT, LLP 445 BROAD HOLLOW ROAD SUITE 420 MELVILLE, NY 11747			EXAMINER CHIN, HUI H	
			ART UNIT 4131	PAPER NUMBER
			MAIL DATE 10/08/2008	DELIVERY MODE PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/570,553	Applicant(s) CHU ET AL.	
	Examiner HUI CHIN	Art Unit 4131	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-31 is/are pending in the application.
4a) Of the above claim(s) 12-28 is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-11 and 29-31 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☒ Claim(s) 1-31 are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. ____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____. |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date <u>6/7/2006</u> . | 6) <input type="checkbox"/> Other: ____. |

DETAILED ACTION

Election/Restrictions

1. Restriction is required under 35 U.S.C. 121 and 372.

This application contains the following inventions or groups of inventions which are not so linked as to form a single general inventive concept under PCT Rule 13.1.

In accordance with 37 CFR 1.499, applicant is required, in reply to this action, to elect a single invention to which the claims must be restricted.

Group I, claims 1-11, 29-31, are drawn to a nanocomposite.

Group II, claims 12-28, are drawn to a process to make the nanocomposite.

The inventions listed as Groups I and II do not relate to a single general inventive concept under PCT Rule 13.1 because, under PCT Rule 13.2, they lack the same or corresponding special technical features for the following reasons: Group I and Group II did not have a common inventive feature: the nanocomposite cited in claim 1 is not novel (see Rodrigues US 2004/0262581).

During a telephone conversation with Michael Brew on 9/17/08 a provisional election was made without traverse to prosecute the invention of Group I, claims 1-11, 29-31. Affirmation of this election must be made by applicant in replying to this Office action. Claims 12-28 are withdrawn from further consideration by the examiner, 37 CFR 1.142(b), as being drawn to a non-elected invention.

Applicant is reminded that upon the cancellation of claims to a non-elected invention, the inventorship must be amended in compliance with 37 CFR 1.48(b) if one

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or more of the currently named inventors is no longer an inventor of at least one claim remaining in the application. Any amendment of inventorship must be accompanied by a request under 37 CFR 1.48(b) and by the fee required under 37 CFR 1.17(i).

The examiner has required restriction between product and process claims. Where applicant elects claims directed to the product, and the product claims are subsequently found allowable, withdrawn process claims that depend from or otherwise require all the limitations of the allowable product claim will be considered for rejoinder. All claims directed to a nonelected process invention must require all the limitations of an allowable product claim for that process invention to be rejoined.

In the event of rejoinder, the requirement for restriction between the product claims and the rejoined process claims will be withdrawn, and the rejoined process claims will be fully examined for patentability in accordance with 37 CFR 1.104. Thus, to be allowable, the rejoined claims must meet all criteria for patentability including the requirements of 35 U.S.C. 101, 102, 103 and 112. Until all claims to the elected product are found allowable, an otherwise proper restriction requirement between product claims and process claims may be maintained. Withdrawn process claims that are not commensurate in scope with an allowable product claim will not be rejoined. See MPEP § 821.04(b). Additionally, in order to retain the right to rejoinder in accordance with the above policy, applicant is advised that the process claims should be amended during prosecution to require the limitations of the product claims. **Failure to do so may result in a loss of the right to rejoinder.** Further, note that the prohibition against double

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patenting rejections of 35 U.S.C. 121 does not apply where the restriction requirement is withdrawn by the examiner before the patent issues. See MPEP § 804.01.

Specification

2. The disclosure is objected to because of the following informalities:

Page 21, line 18, "homogenous" should be –homogeneous--;

Page 22, line 7, "following the following press conditions" is not understood;

Page 25, line 13, "ultimo-tensile strength" is not understood;

Page 26, table 2, there appears to be an error in the reciprocal space (hkl mono) – (010) and (210) reflections of the monoclinic phase on page 26 line 1 are not the same as in the Table 2.

Appropriate corrections are required.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

4. Claims 1-4, 11, 29 and 31 are rejected under 35 U.S.C. 102(e) as being anticipated by Rodrigues (US 2004/0262581).

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For claims 1 and 29

Rodrigues discloses a nanocomposite comprising a) a carbon nanotube and b) a polymeric resin, wherein the nanotube is modified with functional groups to improve compatibility with the polymeric resin, the functional group being selected from NH₂ or ethylenically unsaturated functionalities [0004, 0023-0024] and is generally used in amounts of about 0.0001 to about 50 wt % of the total weight of the composition [0040] and the thermoplastic resin is polyolefin which is generally used in amounts of about 5 to about 99.999 weight percent (wt %) [0016-0017].

Rodrigues further discloses the nanocomposite may be used in a wide variety of commercial applications such as in films [0057] and carbon nanotubes utilized may be single wall carbon nanotubes, multiwall carbon nanotubes, or carbon nanofibers [0018].

For claims 2-4

Rodrigues discloses the use of single wall carbon nanotubes, multiwall carbon nanotubes, and carbon nanofibers (paragraph 18).

For claims 11 and 31

Rodrigues discloses the applications in films (paragraph [0057]).

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the

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invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Rodrigues (US 2004/0262581) as applied to claim 1 above, and further in view of Wu et al. (*Macromolecules* 2003, 36, 6286-6288).

Rodrigues teaches a method to derivatize carbon nanotubes with functional group such as ethylenically unsaturated functionalities [0023-0024].

Rodrigues is silent on the functionalization of these ethylenically unsaturated functionalities on carbon nanotubes.

Wu et al. teach the functionalization of carbon nanotubes by modifying the nanotubes with polybutadiene (col. 1 on page 6286) to obtain materials in the applications ranging from nanotube-based electronics to polymer-based electronics (col. 1 on page 6288). In light of such benefit, it would have been obvious to one of ordinary skill in the art at the time the invention was made to make the nanocomposite with the expected success because Wu et al. demonstrate that the nanotube can be modified with polybutadiene.

The limitations of claim 5 can be found in Wu at col. 1, page 6286, where it discloses the use of polybutadiene.

7. Claims 6-7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Rodrigues (US 2004/0262581) as applied to claim 1 above, and further in view of Haddon et al. (US Patent 6,531,513).

Rodrigues teaches a method to derivatize carbon nanotubes with functional group such as R'NH₂ [0030].

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Rodrigues is silent on the specific $R'NH_2$.

Haddon et al. teach that functionalization of carbon nanotubes by attaching an aliphatic amine wherein the amine is octadecylamine (col 5. lines 29-30) to improve compatibility which can provide the processing of the nanotubes into useful products for various applications including as intermediates in the preparation of composite materials (col. 2 lines 44-50). In light of such benefit, it would have been obvious to one of ordinary skill in the art at the time the invention was made to make the nanocomposite with the expected success because Haddon et al. demonstrate that the functionalized nanotube with octadecylamine can be used to make the nanocomposite.

The limitations of claims 6 and 7 can be found in Haddon at col. 4, line 34, where it discloses the use of octadecylamine.

8. Claims 8-9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Rodrigues (US 2004/0262581) as applied to claim 1 above, and further in view of Dupire et al. (US Patent 6,331,265).

Rodrigues discloses a nanocomposite comprising a) a carbon nanotube and b) a polymeric resin, and the thermoplastic resin is polyolefin [0016-0017].

Rodrigues is silent on the particular polyolefin.

Dupire et al. disclose the use of polyethylene or polypropylene which can succeed in orienting the carbon nanotubes within the polymer and consequently improve in the mechanical properties of the blends (col. 2 lines 45-67).

The limitations of claims 8 and 9 can be found in Dupire at col. 2, lines 48-49, where it discloses the polymer is a polyethylene or a polypropylene.

9. Claims 10-11 and 30-31 are rejected under U.S.C. 103(a) as being unpatentable over Rodrigues (US 2004/0262581) in view of Loontjens et al. (US 2002/0161096).

Rodrigues discloses a method for manufacturing a composition comprising a polymeric resin and carbon nanotubes [0004].

Rodrigues is silent on usage in fibers.

Loontjens discloses that a nanocomposite can be used to produce fibers. Thus, the nanocomposite disclosed by Rodrigues would be fabricated into fibers because Loontjens demonstrate the similar nanocomposite which can be made into fibers. Accordingly, it would have been obvious to one of ordinary skill in the art at the time the invention was made to make the fiber from the nanocomposite disclosed by Rodrigues with the expected success.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to HUI CHIN whose telephone number is (571)270-7350. The examiner can normally be reached on Monday to Friday; 8:00am - 5:00pm EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Sample can be reached on 571-272-1376. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/David R. Sample/
Supervisory Patent Examiner
Art Unit 4131

HC